

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

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(PCT Article 36 and Rule 70)

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| Applicant's or agent's file reference 9595WO/AT/MZ | FOR FURTHER ACTION See Form PCT/IPEA/416 | |
| International application No. PCT/IB2004/004177 | International filing date (day/month/year) 17-12-2004 | Priority date (day/month/year) 23-12-2003 |
| International Patent Classification (IPC) or national classification and IPC G05B9/02 | | |
| Applicant ABB Research Ltd et al | | |

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
 - ☒ (sent to the applicant and to the International Bureau) a total of 4 sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

- This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

| | |
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| Date of submission of the demand 22-07-2005 | Date of completion of this report 08-11-2005 |
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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/IB2004/004177

Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into _____,
which is the language of a translation furnished for the purposes of:
- ☐ international search (Rules 12.3(a) and 23.1(b))
- ☐ publication of the international application (Rule 12.4(a))
- ☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1 - 15 as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☒ the claims:
- pages _____ as originally filed/furnished
- pages* _____ as amended (together with any statement) under Article 19
- pages* 16 - 19 received by this Authority on 25 - 10 - 2005
- pages* _____ received by this Authority on _____
- ☒ the drawings:
- pages 1 - 19 as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/IB2004/004177

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|--------|-------------|-----|
| Novelty (N) | Claims | <u>1-25</u> | YES |
| | Claims | | NO |
| Inventive step (IS) | Claims | <u>1-25</u> | YES |
| | Claims | | NO |
| Industrial applicability (IA) | Claims | <u>1-25</u> | YES |
| | Claims | | NO |

2. Citations and explanations (Rule 70.7)

The claimed invention relates to a method in an industrial safety system for controlling a process or equipment. The system generates an automatic link between an event or alarm and an action to be taken upon receipt of said event or alarm signal due to the event. This is performed by an auto-generation of an HMI (Human Machine Interface) in parallel with an auto-generation of a control code.

The invention solves the problem of how to avoid faults, e.g. bugs that can arise in hand-coded programming codes such as an operator display and which give a wrong indication.

Documents cited in the International Search Report:

| | |
|-----------------------|-------------------|
| D1: NL 1016345 C2 | D4: EP 0482523 A2 |
| D2: US 5054023 A | D5: US 5361198 A |
| D3: US 20020169514 A1 | D6: WO 9704463 A1 |

Documents D1-D3 have been reconsidered to define the general state of the art. Also, documents D4-D6 define the general state of the art.

This report is based upon the amended claims as filed with the letter of 25-10-2005.

Document D1 is considered to represent the closest prior art. Document D1 discloses a security system for supervising power plants (see Derwent abstract) by using double systems, one

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box V

control system and one safety system. Every apparatus in the plant has double connections, one to the control system and one to the safety system. The connections communicate with each other and status values for the supervised apparatus are exchanged. The supervised apparatus is shut down if, for example, the temperature is too high.

The difference between the claimed invention and D1 is that a link is automatically created between an event or an alarm and an action to be taken upon receipt of said event or said alarm signal due to the event. D1 describes a supervision system wherein one of the systems checks status data on a device before the device may be used in the power plant. This difference relates to the problem of how to avoid faults in hand-coded programming codes. Further, D1 does not mention the feature of auto-generation of the HMI (Human Machine Interface).

Documents D1-D6 do not disclose the claimed invention and no relevant combination of the cited documents would lead a person skilled in the art to the invention defined in the claims. The invention according to claims 1-25 is thus novel and is considered to involve an inventive step. It is also considered to be industrially applicable.

CLAIMS

1. A method in a industrial safety system for a process or equipment, which industrial safety system comprises components with safety devices, which control system enables signals to be generated as a result of an event or alarm,
5 **characterized by**
a) configuring a representation of a safety device,
b) configuring a representation of said event or alarm.
c) automatically creating a link between the event or alarm and an action to be
10 taken upon receipt of said event or alarm signal due to the event,
d) generating a control signal to initiate the action.
2. A method according to claim 1, **characterized by**
a) creating a schematic representation of the safety system comprising the
15 components and the safety devices,
b) creating a representation of each component.
3. A method according to any of claims 1-2, **characterized by** creating a
20 representation of each safety device.
4. A method according to any of claims 1-3, **characterized by**
a) creating a representation of each input,
b) creating a representation of each output.
- 25 5. A method according to any of claims 1-4, **characterized by**
a) creating a representation of each action,
b) creating a representation of each event.
- 30 6. A method according to any of claims 1-5, **characterized by**
configuring one or more links comprising a link between the event and the input, comprising a path between the input and the safety device, a path between the safety device and output, and a path between the output and the action.
- 35 7. A method according to any of claims 1-6, **characterized by** displaying
the link by means of a representation in an HMI.

8. A method according to any of claims 1-7, **characterized** by displaying the link by means of a representation in a graphical user interface on a screen.

5 9. A method according to any of claims 1-8, **characterized** in that each path is represented by a table.

10 10. A method according to any of claims 1-9, **characterized** in that each table is displayed in a graphical user interface on a screen.

10 11. A method according to any of claims 1-10, **characterized** in that relations between the representations are displayed in the form of a matrix.

15 12. A method according to any of claims 1-11, **characterized** in that a data communication signal is transmitted to control at least one component in an industrial facility for an industrial process, said data communication signal comprising safety information for controlling the process or equipment in said industrial safety system, such as a signals generated as a result of an event or alarm.

20 13. A computerised industrial system including means to perform a method in an industrial safety system for a process or equipment, which industrial safety system comprises components with safety devices, which control system enables signals to be generated as a result of an event or alarm, **characterized by**

- 25 a) configuring a representation of a safety device,
b) configuring a representation of said event or alarm.
c) automatically creating a link between the event or alarm and an action to be taken upon receipt of said event or alarm signal due to the event,
d) generating a control signal to initiate the action.

30 14. A computer program comprising programming instructions to control a computer or a computer process to make it perform a method in an industrial safety system arranged to automatically creating a link between a representation of a safety device and a representation of an event, according to any of
35 claims 1-12.

15. Use of a computer program according to claim 14 to control a computer or a computer process to make it perform a method in an industrial safety system for controlling a process or equipment, according to any of claims 1-12.

5 16. A computer program according to claim 14 recorded on one or several computer-readable media.

10 17. A graphical user interface for controlling a process or equipment in a industrial safety system, which industrial safety system comprises components with safety devices, that enables signals to be generated as a result of an event or alarm, **characterized by** automatically creating a link between a representation of a safety device and a representation of said event and that said graphical user interface comprises:

15 a) display means to display a representation of said component with safety device,

b) display means to display relations between said components with safety devices,

c) input means to register said components with safety devices and relations.

20 18. A graphical user interface according to claim 17, **characterized by** comprising:

a) input means to register an alarm signal or an event,

b) input means to register an input to a safety device

25 19. A graphical user interface according to any of claims 17-18, **characterized by** comprising:

a) display means to register an input signal,

b) display means to register an output signal.

30 20. A graphical user interface according to any of claims 17-19, **characterized by** comprising input means to register a path.

21. A graphical user interface according to any of claims 17-20, **characterized by** comprising display means for creating a matrix.

22. A system for controlling a process or equipment in a industrial safety system, which industrial safety system comprises components with inputs and safety devices enabling signals to be generated as a result of an event or alarm, **characterized by** automatically creating a link between a representation
5 of a safety device and a representation of an event, and comprising components from any of the list of: a computer such as a tablet personal computer PC, a computer program and a graphical user interface.

23. A system according to claim 22, **characterized by**, comprising a hand-held device displaying said graphical user interface, and input means to said
10 hand-held device.

24. A database containing information to be used in a method in an industrial safety system for controlling a process or equipment, which industrial
15 safety system comprises components with safety devices, which control system enables signals to be generated as a result of an event or alarm, **characterized by**

- a) configuring a representation of a safety device,
- b) configuring a representation of said event or alarm.
- 20 c) automatically creating a link between the event or alarm and an action to be taken upon receipt of said event or alarm signal due to the event,
- d) generating a control signal to initiate the action.

25. A website comprising client/server means to perform a method in an industrial safety system for controlling a process or equipment, which control system enables signals to be generated as a result of an event or alarm, **characterized by**

- a) configuring a representation of a safety device,
- b) configuring a representation of said event or alarm.
- 30 c) automatically creating a link between the event or alarm and an action to be taken upon receipt of said event or alarm signal due to the event,
- d) generating a control signal to initiate the action.